



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,055	12/18/2001	Shu-Woei Chiou	A34893	1991

21003 7590 04/23/2003

BAKER & BOTTS  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER

CRANE, SARA W

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/022,055

Applicant(s)

CHIOU ET AL.

Examiner

Sara W. Crane

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 17 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of claims 1-8 in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komoto et al.

Figure 100 of Komoto et al. shows a light emitting diode having a substrate 2012, 2014, a reflecting layer RE2, an LED epitaxial structure 2016-2024 with n-type layer 2016, 2018, active layer 2020, and p-type layer 2022, 2024 (column 40, lines 58-62). The materials may be III-V compound semiconductors (column 40, line 64, through column 41, line 12). First and second electrodes on exposed portions of the n and p layers are also shown in the figure. Column 44, line 10, states that the reflecting layer RE2 may be a Bragg reflecting mirror. It would have been obvious to use a Bragg reflector as layer RE2 because this is what the reference teaches, and because such a reflector has well-known desirable properties.

Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komoto et al. in view of Coldren et al., Duveneck et al., and Ebeling.

With respect to claim 2, Komoto et al. teaches a Bragg layer of  $\text{AlN}/\text{InN}$ , where the  $\text{AlN}$  is oxidizable (because of the large amount of Al) and the  $\text{InN}$  is hardly oxidized (because it is  $\text{InN}$  and not an oxide compound). Alternatively, each of the other references teaches known material for Bragg reflectors. With respect to claims 2 and 5-7, Duveneck et al. teaches at column 11, line 5, a Bragg reflector of  $\text{Al}_{0.9}\text{Ga}_{0.1}\text{As}$  and  $\text{Al}_{0.3}\text{Ga}_{0.7}\text{As}$ . With respect to claims 3-4, column 3, line 47, of Coldren et al. teaches to include  $\text{AlGaInP}$  in a Bragg reflector.  $\text{AlInP}$  would be encompassed by this teaching, because a quaternary compound includes all of its ternary components. It would have been obvious to use a Bragg reflector for layer RE2 in the Komoto device, made of any of the known materials as taught in the other references, in order to take advantage of the known properties of such materials, in order to obtain optimal reflectivity and desired lattice constants consistent with device layers that are to be grown on top of the reflector. With respect to claim 8, lateral oxidation of an  $\text{AlGaAs}$  layer is taught at Ebeling, column 4, lines 22-24, in order to make the layer an insulator. It would have been obvious to oxidize any of the  $\text{AlGaAs}$  or  $\text{AlAs}$  layers of the other prior art Bragg reflectors for the same reason, i.e., to control the conductivity of the layer structure in order to control the current path. It also would have been obvious to optimize the temperature of the oxidation process, in order to control the oxidation rate and to control undesired diffusion in the rest of the device.

Application/Control Number: 10/022,055  
Art Unit: 2811

Page 4

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (703) 308-4894.

The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read "Sara W. Crane". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Sara W. Crane  
Primary Examiner  
Art Unit 2811